DOCUMENT RESUME

ED 166 130 SP 013 235

AUTHOR Newman, Ian M.; And Others
TITLE Attitudinal and Normative Factors Associated with Adolescent Cigarette Smoking.
PUB DATE Oct 78
NOTE 29p.; Paper presented at the Annual Meeting of the American Public Health Association (Los Angeles, California, October 16, 1978)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS Adolescents; *Behavior Patterns; *Health Education; Parent Influence; Peer Influence; Secondary Grades; *Smoking; Social Behavior; *Student Attitudes; Teacher Influence

ABSTRACT

This paper describes an attempt to use a model of behavioral intention as a diagnostic tool to provide useful data for the preparation of health education programs for adolescents in the area of cigarette smoking. The theory of this model is that a person's behavior is a function of their behavioral intention which, in turn, is a function of their attitude towards a behavior and their perception of subjective or social norms concerning that behavior. Participants in testing this model were high school students in the upper three grades. Questionnaires were designed to indicate students' attitudes on smoking, reasons for smoking or not smoking, and the extent of the influence of significant others on their decisions. It is stated that use of this model provides a qualitative as well as a quantitative understanding of cigarette smoking by high school students. Included in this document are samples of questionnaires submitted to participants and tabular analysis of results. (JD)

# ATTITUDINAL AND NORMATIVE FACTORS ASSOCIATED WITH ADOLESCENT CIGARETTE SMOKING

Ian M. Newman, Ph.D.
Gary L. Martin, Ph.D.
Health Education Department

and

Chris Petersen, MA
Educational Psychology Department
University of Nebraska, Lincoln, Nebraska



A paper presented to the School Health Section, American Public Health Association Annual Meeting, Los Angeles, California, October 16, 1978.

# ATTITUDINAL AND NORMATIVE FACTORS ASSOCIATED WITH ADOLESCENT CIGARETTE SMOKING

One of the most difficult tasks in the development of health education programs is attempting to find a logical basis upon which to build programs. The need for diagnostic techniques and tools based on sound theory is clear.

Fishbein (1,2), in a series of reports and articles, has presented a methodological framework with potential value for the health educator. This paper describes an attempt to use Fishbein's Model of Behavioral Intention (3) as a diagnostic tool to provide useful data for the preparation of health education programs for adolescents in the area of cigarette smoking.

The basic Fishbein model indicates that behavior (cigarette smoking) is closely associated with the person's behavioral intent or what a person says s/he intends to do. The behavioral intent can then be predicted by a linear combination of the person's attitude about the behavior and the person's normative beliefs about the behavior.

To examine the model, a two part analysis was conducted: 1) the first analysis was to determine the predictive value of the model. The two components, attitude and norm, were combined in a multiple regression equation to predict behavioral intent. 2) The components of attitude and norm were then analyzed as a group and then independently to determine their contribution to discriminating between the behaviorally intent smokers and non intent smokers.

## Fishbein's Model

In brief, Fishbein's theory purports that a person's behavior is a function of their behavioral intention, which in turn, is a function of 1) their attitude towards a behavior and 2) their perception of subjective or social norms concerning that behavior. Algebraically this model can be expressed as:

$$B \sim BI = (Ab)w_1 + (SN)w_2$$

B = Behavior; BI = Behavioral Intent; Ab = Attitude toward the behavior; SN = the Subjective Norm; $w_1$ and $w_2$ = Empirically derived regression weights.

Attitude (Ab) towards a behavior, in Fishbein's Theory, is a function of a person's 1) beliefs that performing the behavior will lead to some consequences and 2) the value of the consequences. This relationship is expressed as

$$Ab = \sum b_i e_i$$

Ab = Attitude towards the behavior; $b_i$ = Belief that performing the behavior will lead to some consequences; $e_i$ = the person's Evaluation of the consequence.

An important aspect of this model is that it deals with behaviors, i.e., cigarette smoking, rather than the object of the behavior, i.e., cigarettes.

The subjective norm (SN) is a function of an individual's beliefs about what s/he thinks important others think s/he should do and the motivation to comply with the expectations of the important others. This relationship is expressed as:

$$SN = \sum NB_i(MC_i)$$

SN = Subjective Norm; $NB_i$ = Belief about the social norms or the expectations of important others; $MC_i$ = the Motive to comply with the expectations of the important others.

Instrumentation

Traditionally the questionnaire items are generated by an elicitation process whereby the target population is sampled. Due to the diverse nature of a senior high school, it would have been difficult to obtain a small representative sample. Additionally, there exists a large body of empirical data about the attitudes and norms of high school students as they relate to cigarette

smoking. It was from this body of knowledge that the questionnaire items were selected. Data for this study were gathered by questionnaire using the semantic differential technique (4). Measures were scored +3 or -3 on bipolar scales except for the measure to comply which used a unipolar scale and was scored on a +1 to +7 scale. These scores are presented in the +3 to -3 format (by subtracting 4 from each mean) to provide uniformity in discussing the results. The questionnaire included 17 belief and 17 evaluation items, and 6 normative belief and 6 motivation to comply items. Examples of the types of questions are shown in Figure 1.

The Sample

The entire public high school population of a small midwestern town was selected for the sample. All students attending high school on the testing day completed the questionnaire. There were 407 tenth grade students, 414 eleventh grade students and 255 twelfth grade students. In all grades, the population was approximately evenly divided between boys and girls.

A basic assumption of the Fishbein model was that the behavioral intention can be predicted from a linear combination of the attitudinal and normative components of the model. Behavioral intention was obtained by asking the subjects to rate their probability of smoking cigarettes on three semantic differential scales. Three 7 point scales were used to assess the behavioral intention: probable-improbable; true-false; likely-unlikely. In the tenth grade, there were 95 Intent and 297 Non Intent Smokers; 87 Intent and 308 Non Intent Smokers in the eleventh grade; and 55 Intent and 185 Non Intent Smokers in the twelfth grade.

Analysis: Multiple Regression Evaluation of the Model

The attitude component of the model was obtained by multiplying each belief ($b_i$) by the evaluation of the consequence of the belief ($e_i$) and summing for the 17 items. Similarly, the subjective norm was derived by multiplying each normative belief ($NB_i$) by the motivation to comply ($MC_i$) and summing for the six items.

The estimates of attitude ($\sum b_i e_i$) and subjective norm ($\sum NB_i MC_i$) were then regressed on behavioral intent for each school. Table 1 shows the standardized regression coefficients for each of the components, the multiple correlation (R) and the coefficient of determination ($R^2$).

The multiple correlation (R) shows the Pearson Product-Moment between the behavioral intent and the two independent variables. This ranged from .61 to .62 and was significant at $p < .01$ for all grades. $R^2$ provides an indication of the amount of variance accounted for by the combination of the two independent variables (range 37% to 39%). The standardized regression weights are used to indicate the relative contribution of each of the two independent variables. The regression coefficients were all statistically significant, $p < .01$, with the exceptions of the coefficients for the subjective norm in the tenth and eleventh grades. In all cases the attitude component received a higher coefficient than the normative component, thus indicating a relatively larger contribution to predicting behavioral intent.

It would appear that the attitude and subjective norm are able to predict the behavioral intent to smoke cigarettes for senior high school students. The relative contribution of the subjective norm remains questionable. To be able to use this model to design educational programs, it is necessary to examine the contribution of the components of these two constructs. Each grade was examined separately, combining the individual scores from the two schools.

Initially, a multivariate test, Wilk's Lambda, was conducted and transformed to an F-ratio to determine if the mean vectors of each component ($b_i e_i$, $NC_i MC_i$) significantly differentiated between the behaviorally intent smokers and non intent smokers. When significant, the individual item contributions were assessed by univariate F-tests and by the omega square statistic to determine the independent contribution of each item to the overall discrimination.

Analysis: The Components of Attitude and Norm

Tenth Grade. The F-ratio comparing the mean vectors of one component of the attitude ($b_i$) and the two components of the subjective norm ($NB_i$ and $MC_i$) were all significant at the .01 level of probability (Tables 2-5). This indicates that overall, the belief and normative factors were different for the behaviorally intent smokers and non intent smokers.

In terms of the strengths of the beliefs (Table 2), the behaviorally intent smokers were more likely to believe that smoking helps you relax, is enjoyable, means feeling good, tastes good, and gives you something to do. The non intent smokers were more likely to believe that smoking cigarettes in the company of others is upsetting to them, is an unnecessary expense, causes cancer, means having bad breath, causes heart disease, makes you smell bad, makes your teeth yellow and is bad for your health.

When the independent contributions of each item were assessed using omega square ($\omega^2$), six items contributed to more than 10 percent of the difference between groups. These were: is enjoyable (41.6%), tastes good (38.2%), helps you relax (36.2%), makes you smell bad (14.1%) and is an unnecessary expense (11.6%).

The results of the evaluation of the consequences of the beliefs are presented in Table 3. The mean vectors of the differences between the intent and non intent smokers were significant at the .01 level of probability. Four items

were statistically significant when tested with univariate F-tests. These items were: unnecessary expenses, getting cancer, having bad breath and having bad health. In all cases strong negative evaluations are held by both groups but the non intent smokers were more emphatic in their evaluation. In none of these cases did the item account for more than 10 percent of the difference between the intent and non intent smokers.

In terms of the normative beliefs (Table 4), the non intent smokers more strongly believed that all significant referents, with the exception of their teacher, felt that they should not smoke cigarettes. One referent (for the behaviorally intent smokers) provided a suggestion of approval for cigarette smoking. Two of the normative beliefs accounted for more than 10 percent of the between group difference; my best friend and most people who are important to me.

The students' motivation to comply with the significant referents is given in Table 5. Both groups indicated a positive motivation to comply with the significant others, the only exception being the intent smokers' motivation to comply with their teacher. The two groups differed regarding the degree to which they wished to comply with the wishes of their father, mother, teacher and doctor. The intent smokers more strongly wished to comply with their father and mother while the non intent smokers indicated a stronger motivation to comply with their teacher and doctor.

None of the items accounted for more than 10 percent of the difference between the two groups.

Eleventh Grade. The F-ratios comparing the belief ($b_i$) and evaluation ($e_i$) components of attitude and the two components of the subjective norm ($NB_i$ and $MC_i$) were all statistically significant at the .01 level of probability (Tables 6-9).

Fifteen of the beliefs were statistically different for the behaviorally intent smokers and non intent smokers as determined by univariate F-tests (Table 6). The intent smokers were more likely to believe that smoking cigarettes helps you relax, helps you get along with your friends, is enjoyable, means feeling good, tastes good, helps you make new friends and gives you something to do. The non intent smokers were more likely to believe that smoking in the company of others is upsetting to them, is an unnecessary expense, causes cancer, means having bad breath, causes heart disease, makes you smell bad, makes your teeth yellow and is bad for your health.

Ten of the belief items accounted for more than 10 percent of the between group difference according to the omega square statistic; tastes good (39.6%), is enjoyable (38.3%), helps you relax (29.9%), means feeling good (16.2%), is an unnecessary expense (16.2%), is bad for your health (14.6%), is upsetting to others (13.8%), makes you smell bad (13.1%), means having bad breath (11.3%) and makes your teeth yellow (10.1%).

The mean scores indicating the evaluation of the consequences of the behavior are given in Table 7. Eight of the 17 items discriminated between the behaviorally intent smokers and non intent smokers. In all cases the non intent smokers felt more strongly about the negative consequences of the belief. The statistically significant beliefs were: upsetting others, unnecessary expenses, getting cancer, having bad breath, getting heart disease, smelling bad, having yellow teeth and having bad health. None of the evaluation of the consequences of the belief items accounted for more than 10 percent of the difference between groups.

The normative beliefs regarding the salient referents are given in Table 8. The non intent smokers believed more strongly than the intent smokers that all referents think that they should not smoke cigarettes. The referent "my best

friend" appears to have a negative (thinks I should...) influence on the behaviorally intent smokers.

Two of the items accounted for more than 10 percent of the between group difference according to the omega square statistic: my best friend (33.2%) and most people who are important to me (19.2%).

The scores indicating motivation to comply with the significant referents are given in Table 9. All referents, except my best friend, appeared to differentiate between the intent smokers and non intent smokers. In all cases the beliefs indicated a stronger (want to) motivation to comply for the non intent smokers. For the intent smokers, there did appear to be a negative motivation to comply with my teacher.

One of the items measuring motivation to comply accounted for more than 10 percent of the between group difference, my teacher (15.8%).

Twelfth Grade. In comparing the mean vectors of the two components of the attitudes ($b_i$ and $e_i$) and the two components of the subjective norm ($NB_i$ and $MC_i$), all four components were significantly different in discriminating between the behaviorally intent smokers and non intent smokers (Tables 10-13).

Examination of the beliefs about cigarette smoking (Table 10) reveals that the intent smokers were more likely to believe that cigarette smoking helps you relax, helps you feel grown up, helps you get along with your friends, is enjoyable, means feeling good, tastes good, and gives you something to do. The non intent smokers were more likely to believe that it is upsetting to others, is an unnecessary expense, causes cancer, means having bad breath, causes heart disease, makes you smell bad, makes your teeth yellow and is bad for your health.

The omega square statistic provided eight belief items providing more than 10 percent of the between group discrimination: is enjoyable (48.0%), tastes

good (37.1%), helps you relax (32.9%), means feeling good (192.%), is an unnecessary expense (14.9%), is upsetting to others (14.2%), makes your teeth yellow (13.0%) and makes you smell bad (11.6%).

The mean scores reflecting the evaluation of the consequences of the beliefs are given in Table 11. Five of the 17 evaluations were statistically significant according to univariate F-tests. For all five items, getting cancer, feeling good, having bad breath, getting heart disease and having yellow teeth, the non intent smokers felt more strongly about the evaluation of the belief. None of the items evaluating the consequences of the belief accounted for more than 10 percent of the between group difference.

The normative belief scores (Table 12) show that the non intent smokers believed more strongly that all significant referents would disapprove of them smoking. For the behaviorally intent smokers their best friend appeared to be the only support for them smoking. Of the six items comprising the normative belief, only one, my best friend (31.9%), accounted for more than 10 percent of the difference according to the omega square statistic.

The students' motivation to comply with the salient referents are given in Table 13. The intent smokers and non intent smokers differed regarding their motivation to comply with the wishes of three of the referents; most people who are important to me, my mother and my teacher. Again, the non intent smokers appeared to show a stronger motivation to comply with the referent. None of the motivation to comply items accounted for more than 10 percent of the between group difference.

## Summary and Conclusions

Initially it must be understood that this investigation was designed to apply a theoretical framework of health behavior, the Fishbein Model of Behavioral Intent. The intent was to assess the utility, and robustness of a

specific approach to educational diagnosis and program planning. This was not intended as a theoretical validation of the model. These issues have been addressed by several independent studies. Therefore no attempts were made to independently investigate the inner correlations between independent measure of attitude and norm and the respective beliefs, evaluations, subjective norms or motivations to comply. Similarly the relationship between behavior and behavioral intent as well as the relationship between behavior and the other components of the model were not addressed.

It must be remembered that this model has demonstrated its greatest advantages when used on relatively small, homogeneous groups of subjects and a relatively short time limit is given to behavioral intent (e.g., I intend to smoke cigarettes in the next two weeks). The individual items are traditionally derived directly from a subset of the target population. The present application of the model used more general items, derived from the literature and was applied to an entire population of public school students in a senior high school.

It does appear that the estimates of attitudes and normative factors, as described by Fishbein, can be used to meaningfully predict behavioral intention. The subjective norm appears to contribute relatively little to the prediction of behavioral intent, a finding which is similar to the results of other investigations. The finding that attitude and norm are associated with measures of smoking status is not new. However, when there is a need for educational diagnosis and program planning, it is of little benefit to have one (attitude) or two (attitude and subjective norm) individual constructs from which to base the design of an entire educational program. The utility of the Fishbein model is that it allows consideration of the individual components of these constructs and their relationships as they contribute to understanding a specific health behavior.

In terms of the components of attitude, it is clear that both beliefs and the evaluations of the consequences of belief discriminate between the behaviorally intent smokers and non intent smokers. The individual items measuring belief show a great disparity between the two groups while the individual evaluation items appear to be much less powerful in discriminating between the intent smokers and non intent smokers. Certain belief items appear to be particularly effective discriminators: the belief that cigarette smoking is enjoyable; that it tastes good, that it helps you relax, that it means feeling good, that it tastes good, that it helps you relax, that it means feeling good, that it is an unnecessary expense and that it makes you smell bad. Behaviorally intent and non intent smokers share many beliefs, e.g., cigarette smoking is habit forming and it is an unnecessary expense. However, they differ considerably in terms of the strength of the belief (no apparent difference in the belief that smoking cigarettes is habit forming) and in terms of the evaluation of the belief (the intent smokers indicating that this consequence is less important than the non intent smokers).

The subjective norm appears to contribute little to the prediction of behavioral intention. However, upon examination of the components of subjective norm (six normative beliefs and six indications of motivation to comply), it is quite possible to discriminate between behaviorally intent and non intent smokers. The referent "my best friend" is clearly perceived by the non intent smokers as not supporting his/her smoking cigarettes and provides some support for thinking "...I should smoke cigarettes" for the intent smoker. In terms of motivation to comply with the significant referents, it appears that the teacher is associated with the lowest motivation to comply scores. Other referents may exert more normative influence on both intent and non intent smokers.

Countless research efforts have documented the association between health behaviors, attitudes and various social normative factors. Too often these global concepts, while providing a significant contribution to theoretical efforts, have left the practitioner with little substance for designing an educational program. The use of the Fishbein model in the present investigation has demonstrated that it is a useful tool in providing a qualitative as well as a quantitative understanding of cigarette smoking by high school students.

ACKNOWLEDGEMENTS

We wish to acknowledge the assistance given by Ms. Carla Hiatt and Ms. Theresa Sledge in the preparation of the data for this paper.

## REFERENCES


1. Fishbein M: Attitude and the prediction of behavior. In: Fishbein M: Readings in attitude theory and measurement. New York: Wiley, 1967.

2. Fishbein M: Toward an understanding of family planning behavior. J App Soc Psychol, 2:204-227, 1972.

3. Fishbein M, Ajzen I: Belief, attitude, intention and behavior: an introduction to theory and research. Reading, Mass: Addison-Wesley, 1975.

4. Osgoode C, Succi G, Tannenbaum P: The measurement of meaning. Urbana: University of Illinois Press, 1957.

Figure 1

FISHBEIN CONSTRUCTS AND EXAMPLES
FROM THE SEMANTIC DIFFERENTIAL SCALE

BEHAVIORAL INTENTION:

I intend to smoke cigarettes in the future.

Probable ____:____:____:____:____:____:____ Improbable

BELIEF ABOUT THE BEHAVIOR:

Smoking cigarettes in the company of others is upsetting to them.

Likely ____:____:____:____:____:____:____ Unlikely

EVALUATION OF CONSEQUENCES:

For me, to upset others is

Good ____:____:____:____:____:____:____ Bad

NORMATIVE BELIEF:

My mother thinks I

Should ____:____:____:____:____:____:____ Should not smoke cigarettes.

MOTIVATION TO COMPLY:

In general I

Want to ____:____:____:____:____:____:____ Do not want to do what my mother thinks I should do.

TABLE 1

MULTIPLE REGRESSION ANALYSES PREDICTING BEHAVIORAL INTENTION FROM ATTITUDE AND SUBJECTIVE NORM

| GRADE | STANDARDIZED REGRESSION COEFFICIENTS | | MULTIPLE R | $R^2$ |
|---|---|---|---|---|
| | Attitude | Subjective Norm | | |
| 10 | .591* | .042 | .61* | .376 |
| 11 | .581* | .082 | .61* | .383 |
| 12 | .549* | .180* | .63* | .394 |

*SIGNIFICANT AT $p < .01$

TABLE 2

10TH GRADE

MEAN SCORES OF BELIEFS
(LIKELY [-3] - UNLIKELY [+3])
FOR BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| BELIEF Smoking Cigarettes | INTENT SMOKERS N=95 | NON INTENT SMOKERS N=297 | F-RATIO | $\omega^2$ |
|---|---|---|---|---|
| 1. IS UPSETTING TO OTHERS. | .27 | -1.00 | 36.358* | .083 |
| 2. IS AN UNNECESSARY EXPENSE. | - .62 | -2.26 | 76.956* | .116 |
| 3. HELPS YOU RELAX. | -1.37 | 1.54 | 223.105* | .362 |
| 4. HELPS YOU FEEL GROWN UP. | 1.33 | 1.53 | .752 | -.001 |
| 5. HELPS YOU GET ALONG WITH YOUR FRIENDS. | 1.04 | 1.52 | 4.994 | .010 |
| 6. IS ENJOYABLE. | -1.18 | 1.92 | 280.660* | .416 |
| 7. IS HABIT FORMING. | -2.28 | -2.45 | 1.268 | .001 |
| 8. CAUSES CANCER. | -1.85 | -2.41 | 15.438* | .036 |
| 9. MEANS FEELING GOOD. | .13 | 1.94 | 116.925* | .228 |
| 10. TASTES GOOD. | .49 | 2.22 | 243.737* | .382 |
| 11. MEANS HAVING BAD BREATH. | -1.09 | -2.18 | 37.010* | .084 |
| 12. CAUSES HEART DISEASE. | - .66 | -1.50 | 19.550* | .045 |
| 13. HELPS YOU MAKE NEW FRIENDS. | 1.08 | 1.50 | 3.981 | .008 |
| 14. MAKES YOU SMELL BAD. | - .75 | -2.14 | 65.358* | .141 |
| 15. MAKES YOUR TEETH YELLOW. | -1.20 | -2.20 | 43.025* | .097 |
| 16. GIVES YOU SOMETHING TO DO. | -1.26 | - .03 | 28.680* | .066 |
| 17. IS BAD FOR YOUR HEALTH. | -1.96 | -2.67 | 38.753* | .085 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS:
F = 23,762, DF = 17 AND 374, $p < .0001$

*UNIVARIATE F-RATIO, DF = 1 AND 390, $p < .01$

TABLE 3

10TH GRADE

MEAN SCORES OF THE EVALUATION OF THE CONSEQUENCES
(GOOD [-3] - BAD [+3])
FOR BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| CONSEQUENCES For me | INTENT SMOKERS N=95 | NON-INTENT SMOKERS N=297 | F-RATIO | $w^2$ |
|---|---|---|---|---|
| 1. TO UPSET OTHERS IS | 2.17 | 2.33 | 1.476 | .001 |
| 2. UNNECESSARY EXPENSES ARE | 1.33 | 1.84 | 7.922* | .017 |
| 3. BEING ABLE TO RELAX IS | -2.58 | -2.55 | .096 | -.002 |
| 4. FEELING GROWN UP IS | -1.04 | -1.21 | .894 | .000 |
| 5. GETTING ALONG WITH FRIENDS IS | -2.64 | -2.76 | 1.714 | .002 |
| 6. ENJOYABLE THINGS ARE | -2.60 | -2.62 | .036 | -.002 |
| 7. HABITS ARE | 0.43 | 0.60 | .700 | -.008 |
| 8. GETTING CANCER IS | 2.48 | 2.86 | 16.763* | .039 |
| 9. FEELING GOOD IS | -2.77 | -2.72 | .407 | -.002 |
| 10. EXPERIENCING GOOD TASTES IS | -1.95 | -2.03 | -.296 | -.002 |
| 11. HAVING BAD BREATH IS | 2.42 | 2.77 | 12.568* | .029 |
| 12. GETTING HEART DISEASE IS | 2.66 | 2.84 | -3.789 | .007 |
| 13. MAKING NEW FRIENDS IS | -2.62 | -2.66 | -.131 | .002 |
| 14. SMELLING BAD IS | 2.65 | 2.81 | 2.904 | .005 |
| 15. HAVING YELLOW TEETH IS | 2.58 | 2.75 | 2.498 | .004 |
| 16. HAVING SOMETHING TO DO IS | -2.58 | -2.36 | 3.557 | .006 |
| 17. HAVING BAD HEALTH IS | 2.54 | 2.80 | 7.890* | .017 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS:
$F \geq 2.332$, DF = 17 AND 374, $p < .0022$

*UNIVARIATE F-RATIO, DF = 1 AND 390, $p < .01$

TABLE 4

10TH GRADE

MEAN SCORES OF THE NORMATIVE BELIEFS
(SHOULD [-3] - SHOULD NOT [+3])
FOR BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| REFERRENT thinks I (should-should not) smoke cigarettes. | INTENT SMOKERS N=95 | NON INTENT SMOKERS N=297 | F-RATIO | $\omega^2$ |
|---|---|---|---|---|
| 1. MOST PEOPLE WHO ARE IMPORTANT TO ME | .78 | 2.55 | 130.610* | .248 |
| 2. MY FATHER | 2.04 | 2.70 | 21.036* | .047 |
| 3. MY MOTHER | 2.00 | 2.70 | 22.475* | .032 |
| 4. MY BEST FRIEND | -0.20 | 2.15 | 149.590* | .275 |
| 5. MY TEACHER | 2.17 | 2.45 | 3.929 | .007 |
| 6. MY DOCTOR | 2.30 | 2.75 | 16.390* | .038 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS:
$F = 33.303$, DF = 6 AND 385, $P < .0001$

*UNIVARIATE F-RATIO, DF = 1 AND 390, $P < .01$

TABLE 5

10TH GRADE

MEAN SCORES OF MOTIVATION TO COMPLY
(WANT TO [-3] - DO NOT WANT TO [+3])
FOR BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| REFERRENT<br>*In general I (want to- do not want to) do what thinks I should do.* | *INTENT SMOKERS N=95* | *NON INTENT SMOKERS N=297* | *F-RATIO* | $\omega^2$ |
|---|---|---|---|---|
| 1. MOST PEOPLE WHO ARE IMPORTANT TO ME | -0.61 | -1.07 | 4.295 | .008 |
| 2. MY FATHER | -0.82 | -1.79 | 25.196* | .058 |
| 3. MY MOTHER | -0.74 | -1.83 | 34.379* | .078 |
| 4. MY BEST FRIEND | -0.25 | -1.13 | 4.022 | .008 |
| 5. MY TEACHER | 0.72 | -0.66 | 42.145* | .095 |
| 6. MY DOCTOR | -1.17 | -1.80 | 10.789* | .071 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS:
$F = 8.845$, DF = 6 AND 385, $p < .0001$.

*UNIVARIATE F-RATIO, DF = 1 AND 390, $p < .01$

TABLE 6

11TH GRADE

MEAN SCORES OF BELIEFS
(LIKELY [-3] - UNLIKELY [+3])
BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| BELIEF Smoking Cigarettes | INTENT SMOKERS N=87 | NON INTENT SMOKERS N=308 | F-RATIO | $w^2$ |
|---|---|---|---|---|
| 1. IS UPSETTING TO OTHERS. | .20 | -1.37 | 63.966* | .138 |
| 2. IS AN UNNECESSARY EXPENSE. | - .90 | -2.30 | 59.771* | .162 |
| 3. HELPS YOU RELAX. | -1.34 | 1.45 | 168.819* | .299 |
| 4. HELPS YOU FEEL GROWN UP. | 1.36 | 1.77 | 4.165 | .008 |
| 5. HELPS YOU GET ALONG WITH FRIENDS. | 1.30 | 2.08 | 15.819* | .036 |
| 6. IS ENJOYABLE. | .90 | 2.06 | 246.448* | .383 |
| 7. IS HABIT FORMING. | -2.13 | -2.50 | 6.520 | .014 |
| 8. CAUSES CANCER. | -1.41 | -2.20 | 19.567* | .045 |
| 9. MEANS FEELING GOOD. | .58 | 2.09 | 77.651* | .162 |
| 10. TASTES GOOD. | - .38 | 2.34 | 259.509* | .396 |
| 11. MEANS HAVING BAD BREATH. | -1.02 | -2.24 | 51.134* | .113 |
| 12. CAUSES HEART DISEASE. | - .52 | -1.66 | 40.189* | .090 |
| 13. HELPS YOU MAKE NEW FRIENDS. | -1.22 | 2.06 | 20.184* | .046 |
| 14. MAKES YOU SMELL BAD. | - .78 | -2.11 | 60.655* | .131 |
| 15. MAKES YOUR TEETH YELLOW. | - .87 | -2.12 | 51.554* | .101 |
| 16. GIVES YOU SOMETHING TO DO. | 1.30 | - .06 | 29.150* | .066 |
| 17. IS BAD FOR YOUR HEALTH. | -1.64 | -2.66 | 68.716* | .146 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS:
F = 23.486, DF = 17 AND 377, $P < .0001$

*UNIVARIATE F-RATIO, DF = 1 AND 393, $P < .01$

TABLE 7

11TH GRADE

MEAN SCORES OF THE EVALUTION OF THE CONSEQUENCES (GOOD [-3] - BAD [+3]) FOR BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| CONSEQUENCES For me | INTENT SMOKERS N=87 | NON INTENT SMOKERS N=308 | F-RATIO | $\omega^2$ |
|---|---|---|---|---|
| 1. TO UPSET OTHERS IS | 2.00 | 2.49 | 15.722* | .036 |
| 2. UNNECESSARY EXPENSES ARE | 1.30 | 1.89 | 10.188* | .023 |
| 3. BEING ABLE TO RELAX IS | -2.56 | -2.65 | .841 | -.000 |
| 4. FEELING GROWN UP IS | -1.21 | -1.59 | 5.503 | .011 |
| 5. GETTING ALONG WITH FRIENDS IS | -2.62 | -2.75 | 2.418 | .001 |
| 6. ENJOYABLE THINGS ARE | -2.53 | -2.74 | 5.035 | .010 |
| 7. HABITS ARE | 0.14 | 0.47 | 2.640 | .002 |
| 8. GETTING CANCER IS | 2.63 | 2.85 | 7.715* | .017 |
| 9. FEELING GOOD IS | -2.53 | -2.74 | 5.177 | .010 |
| 10. EXPERIENCING GOOD TASTES IS | -1.98 | -2.32 | 5.760 | .012 |
| 11. HAVING BAD BREATH IS | 2.29 | 2.78 | 21.161* | .048 |
| 12. GETTING HEART DISEASE IS | 2.45 | 2.78 | 7.174* | .015 |
| 13. MAKING NEW FRIENDS IS | -2.54 | -2.65 | 1.213 | .000 |
| 14. SMELLING BAD IS | 2.41 | 2.85 | 26.815* | .061 |
| 15. HAVING YELLOW TEETH IS | 2.07 | 2.72 | 24.920* | .057 |
| 16. HAVING SOMETHING TO DO IS | -2.39 | -2.53 | 1.671 | .002 |
| 17. HAVING BAD HEALTH IS | 2.31 | 2.78 | 17.093* | .039 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS: $F = 3.578$, DF = 17 AND 377, $p < .0001$

*UNIVARIATE F-RATIO, DF = 1 AND 393, $p < .01$

TABLE 8

11TH GRADE

MEAN SCORES OF THE NORMATIVE BELIEFS
(SHOULD [-3] - SHOULD NOT [+3])
FOR BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| REFERRENT, *thinks I (should-should not) smoke cigarettes.* | INTENT SMOKERS N=87 | NON INTENT SMOKERS N=308 | F-RATIO | $\omega^2$ |
|---|---|---|---|---|
| 1. MOST PEOPLE WHO ARE IMPORTANT TO ME | 1.29 | 2.66 | 94.619* | .192 |
| 2. MY FATHER | 2.07 | 2.74 | 26.700* | .061 |
| 3. MY MOTHER | 2.12 | 2.83 | 39.067* | .088 |
| 4. MY BEST FRIEND | -0.25 | 2.35 | 198.027* | .332 |
| 5. MY TEACHER | 1.59 | 2.56 | 38.921* | .088 |
| 6. MY DOCTOR | 2.01 | 2.78 | 42.897* | .096 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS:
$F = 39.579$, DF = 6 AND 388, $P < .0001$

*UNIVARIATE F-RATIO, DF = 1 AND 393, $P < .01$

TABLE 9

11TH GRADE

MEAN SCORES OF MOTIVATION TO COMPLY
(WANT TO [-3]- DO NOT WANT TO [+3])
FOR BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| REFERRENT *In general I (want to- do not want to) do what thinks I should do.* | INTENT SMOKERS N=87 | NON INTENT SMOKERS N=308 | F-RATIO | $\omega^2$ |
|---|---|---|---|---|
| 1. MOST PEOPLE WHO ARE IMPORTANT TO ME | -0.53 | -1.22 | 10.167* | .023 |
| 2. MY FATHER | -0.58 | -1.68 | 28.413* | .065 |
| 3. MY MOTHER | -1.02 | -1.74 | 13.640* | .031 |
| 4. MY BEST FRIEND | -0.80 | -1.10 | 2.245 | .004 |
| 5. MY TEACHER | 1.02 | -0.83 | 74.810* | .158 |
| 6. MY DOCTOR | -0.82 | -1.89 | 30.797* | .070 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS:
$F = 17.130$, DF = 6 AND 388, $p < .0001$

*UNIVARIATE F-RATIO, DF = 1 AND 393, $p < .01$

TABLE 10

12TH GRADE

MEAN SCORES OF BELIEFS
(LIKELY [-3] - UNLIKELY [+3])
BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| BELIEF Smoking Cigarettes | INTENT SMOKERS N=55 | NON INTENT SMOKERS N=185 | F-RATIO | $\omega^2$ |
|---|---|---|---|---|
| 1. IS UPSETTING TO OTHERS. | .13 | -1.33 | 40.800* | .142 |
| 2. IS AN UNNECESSARY EXPENSE. | - .87 | -2.37 | 42.937* | .149 |
| 3. HELPS YOU RELAX. | -1.20 | 1.57 | 118.498* | .329 |
| 4. HELPS YOU FEEL GROWN UP. | 1.26 | 1.44 | .434 | .002 |
| 5. HELPS YOU GET ALONG WITH YOUR FRIENDS. | 1.24 | 1.95 | 7.364* | .026 |
| 6. IS ENJOYABLE | -1.29 | 2.11 | 222.819* | .480 |
| 7. IS HABIT FORMING. | -2.20 | -2.56 | 3.794 | .011 |
| 8. CAUSES CANCER. | -1.66 | -2.33 | 11.075* | .040 |
| 9. MEANS FEELING GOOD. | .42 | 2.05 | 58.068* | .192 |
| 10. TASTES GOOD. | - .38 | 2.25 | 142.618* | .371 |
| 11. MEANS HAVING BAD BREATH. | -1.09 | -2.24 | 23.731* | .087 |
| 12. CAUSES HEART DISEASE. | - .64 | -1.63 | 16.234* | .060 |
| 13. HELPS YOU MAKE NEW FRIENDS. | 1.38 | 1.96 | 6.028 | .021 |
| 14. MAKES YOU SMELL BAD. | - .87 | -2.15 | 32.638* | .116 |
| 15. MAKES YOUR TEETH YELLOW. | -1.07 | -2.21 | 36.661* | .130 |
| 16. GIVES YOU SOMETHING TO DO. | -1.26 | - .01 | 16.084* | .059 |
| 17. IS BAD FOR YOUR HEALTH. | -1.73 | -2.66 | 30.609* | .012 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS:
F = 16.949, DF = 17 AND 222, $p < .0001$

*UNIVARIATE F-RATIO, DF = 1 AND 238, $p < .01$

TABLE 11

12TH GRADE

MEAN SCORES OF THE EVALUATION OF THE CONSEQUENCES (GOOD [-3] - BAD [+3]) FOR BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| CONSEQUENCES For me | INTENT SMOKERS N= 55 | NON INTENT SMOKERS N=185 | F-RATIO | $\omega^2$ |
|---|---|---|---|---|
| 1. TO UPSET OTHERS IS | 1.96 | 2.38 | 5.244 | .017 |
| 2. UNNECESSARY EXPENSES ARE | 1.47 | 1.78 | 1.684 | -.003 |
| 3. BEING ABLE TO RELAX IS | -2.51 | -2.62 | .580 | -.002 |
| 4. FEELING GROWN UP IS | -1.26 | -1.70 | 4.574 | .015 |
| 5. GETTING ALONG WITH FRIENDS IS | -2.51 | -2.74 | 2.982 | .008 |
| 6. ENJOYABLE THINGS ARE | -2.54 | -2.64 | .551 | -.002 |
| 7. HABITS ARE | .00 | 0.31 | 1.425 | .002 |
| 8. GETTING CANCER IS | 2.36 | 2.88 | 15.128* | .056 |
| 9. FEELING GOOD IS | -2.40 | -2.78 | 8.156* | .029 |
| 10. EXPERIENCING GOOD TASTES IS | -2.02 | -2.11 | .160 | -.003 |
| 11. HAVING BAD BREATH IS | 2.54 | 2.84 | 8.223* | .029 |
| 12. GETTING HEART DISEASE IS | 2.38 | 2.82 | 8.400* | .029 |
| 13. MAKING NEW FRIENDS IS | -2.53 | -2.79 | 6.500 | .022 |
| 14. SMELLING BAD IS | 2.71 | 2.88 | 2.995 | .008 |
| 15. HAVING YELLOW TEETH IS | 2.49 | 2.83 | 10.733* | .039 |
| 16. HAVING SOMETHING TO DO IS | -2.34 | -2.50 | 1.115 | .000 |
| 17. HAVING BAD HEALTH IS | 2.71 | 2.72 | .012 | -.004 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS: $F = 2.390$, DF = 17 AND 222, $p < .0021$

*UNIVARIATE F-RATIO, DF = 1 AND 238, $p < .01$

TABLE 12

12TH GRADE

MEAN SCORES OF THE NORMATIVE BELIEFS
(SHOULD [-3] - SHOULD NOT [+3])
FOR BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| *REFERRENT thinks I (should-should not) smoke cigarettes.* | *INTENT SMOKERS N=55* | *NON INTENT SMOKERS N=185* | *F-RATIO* | $\omega^2$ |
|---|---|---|---|---|
| 1. MOST PEOPLE WHO ARE IMPORTANT TO ME | 1.76 | 2.65 | 23.967* | .045 |
| 2. MY FATHER | 2.20 | 2.75 | 13.679* | .050 |
| 3. MY MOTHER | 2.14 | 2.80 | 16.225* | .060 |
| 4. MY BEST FRIEND | -0.11 | 2.35 | 113.208* | .319 |
| 5. MY TEACHER | 1.76 | 2.38 | 9.202* | .033 |
| 6. MY DOCTOR | 2.04 | 2.72 | 15.562* | .057 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS:
$F = 20.215$, DF = 6 AND 233, $P < .0001$

*UNIVARIATE F-RATIO, DF = 1 AND 238, $P < .01$

TABLE 13

12TH GRADE

MEAN SCORES OF MOTIVATION TO COMPLY
(WANT TO [-3]--DO NOT WANT TO [+3])
FOR BEHAVIORALLY INTENT SMOKERS AND NON INTENT SMOKERS

| REFERRENT<br>*In general (want to-do not want to) do what thinks I should do.* | *INTENT SMOKERS N=55* | *NON INTENT SMOKERS N=185* | *F-RATIO* | $\omega^2$ |
|---|---|---|---|---|
| 1. MOST PEOPLE WHO ARE IMPORTANT TO ME | -.46 | -1.21 | 8.193* | .034 |
| 2. MY FATHER | -1.04 | -1.55 | 4.418 | .011 |
| 3. MY MOTHER | -1.04 | -1.68 | 7.542* | .026 |
| 4. MY BEST FRIEND | -0.87 | -1.08 | .833 | -.001 |
| 5. MY TEACHER | 0.36 | -0.74 | 18.300* | .067 |
| 6. MY DOCTOR | -1.09 | -1.60 | 4.289 | .014 |

F-RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS:
$F = 4.375$, DF = 6 AND 233, $p < .0004$

*UNIVARIATE F-RATIO, DF = 1 AND 238, $p < .01$